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Community energies: Exploring the socio-political spatiality of energy transitions through the Clean Energy for Eternity campaign in New South Wales Australia

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ABSTRACT

This paper analyses the spatial and scalar dynamics of a community-based campaign called Clean Energy for Eternity (CEFE), which has successfully promoted the use of solar and wind power on the far south coast of New South Wales (NSW), Australia. In this article we deploy three different approaches to understanding the role of scale; namely locational, relational and strategic rescaling. For the past decade, multi-scalar interventions by CEFE have provided a platform for community energy generation projects, facilitated by the development of social infrastructure that engendered new ideas, interactions and potentials, engagement and participation. These interventions have transformed the region's multiple, multi-scalar geographies of community engagement, energy use and climate change. Analysing CEFE assists in thinking about the relational aspects of energy demand, supply and use, as well as the spatiality of political mobilisation. As a grassroots movement that subsequently tried to scale up and out its activities, CEFE also alerts us to the relational nature of both barriers and opportunities for any transition towards a low carbon economy. Perhaps most significantly, the example of CEFE demonstrates how existing notions of the geographies of energy in Australia can be challenged and transformed.

1. Introduction

This paper analyses the spatial and scalar dynamics of a community-based campaign called Clean Energy for Eternity (CEFE), which for the past decade has successfully promoted the use of solar and wind power, particularly on public buildings on the far south coast of New South Wales (NSW). In doing so, it has reframed existing notions of the geographies of energy in Australia, challenging and transforming previous notions of 'energy from somewhere' to a locally engaged 'energy from here' by solidifying connections between community engagement, energy use and climate change. From its initial geographic origins in the small town of Tathra,[1] CEFE's subsequent activities provide an entry point into thinking about both the relational aspects of energy demand, supply and use, as well as the spatiality of political mobilisation. Its innovative use of political symbolism to refashion everyday spaces into sites of activism, such as the use of thousands of volunteers in the formation of human signs bearing climate change messages has been an extremely effective engagement in the politics of place.

The success of CEFE's activities over the past decade has translated into relational engagements at a variety of scales, including the individual (by fostering household level change around efficiency); the community (such as the installation of solar panels on community buildings, resources for community organisations like rural fire services and surf lifesavings clubs); and institutional (by altering the processes around local government energy planning). The linkages forged across these multi-scalar interventions were facilitated by the development of social infrastructure that generated new ideas, interactions and potentials, engagement and participation − all of which provided a platform for community energy. As a grassroots movement that subsequently tried to scale up and out its activities, CEFE also alerts us to the relational nature of both barriers and opportunities for any transition towards a low carbon economy. The process of transition is critical, as it is the interplay of agency and structure, power, contingency and practice that shape both energy norms and behaviours [1]. Until recently, there

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[1] Tathra is a coastal town of around 1500 people that predominantly acts as a satellite for the town of Bega as well as a holiday destination, especially during the summer period. It is overwhelmingly dominated by white, English speaking residents, who are employed in professions and trade related occupations. See http://tathra.localstats.com.au/demographics/nsw/south-coast/south-coast/tathra The Bega Valley shire is an area on the far south coast of New South Wales (NSW). This region is comparatively isolated and characterised by greater than average under-employment. Median household income in this shire (A$986 per week) is considerably lower than the average for the state of NSW as a whole (A$1486). See http://www.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/LGA10550

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has been little attention to the construction of spaces in which these transitions occur. Bridge et al. [2] illustrate the ways that the spatial patterns of the economic and social activities shape, and are shaped by efforts to transition to low-carbon energy. It suggests that energy researchers and activists need to engage with multiple multi-scalar geographies beyond just physical supply to incorporate a more nuanced politics of low carbon energy transitions that includes the social and cultural components of energy demand, supply and use.

One way of understanding energy transitions is through the concept of scale. The role and meaning of scale is much debated in geography (and beyond) (e.g. [3–5]). Our purpose here is not to engage directly in this debate, but rather to highlight how scale might be used as an analytical concept to provide insights for understanding opportunities and limitations of community energy in place. Instead, in order to understand the energy transition in CEFE, we assert the need to understand how scale was used by a range of actors to mobilize action and cultural change about the meaning of energy supply and use. As Bridge et al. [2] discuss, the spatial organisation of energy systems and the distribution of impacts that transitions have internally and externally (both within and between particular places) are inherently geographical. While there are a myriad of ways that scale can be deployed, we identify scale as location, scale as relational and scale as strategy as useful for understanding the CEFE experience.

2. Locational scale as a site of intervention

The geographical location and setting of energy is shaped by the spatial distribution and diffusion of norms, behaviours and technologies of energy systems across space. The most obvious way that scale is invoked with regards to energy transition is based on the site of intervention. Energy transitions are often conceived of having multiple sites for intervention, from global (such as through global climate change agreements) through to the individual scale (such as sustainable consumption). Different sites of intervention highlight different roles for actors and make assumptions about who should be involved and how energy transition might be governed.

For example, evidence suggests that large-scale, state-led technological innovation is critical for leading a sustainable energy transition, but they need related regulatory changes and support from non-state actors [6]. Similarly, Chu and Majundar [7] highlight the important role of national interventions in a sustainable energy future. Such national-level policy interventions are often perceived to be linear in terms of cause and effect and are thus easier to measure (Bergman et al., 2010). Debate exists over which policy instruments are most effective to drive transition towards more sustainable energy sources, but the assumption is that efforts such as carbon taxes, tradable energy permits and feed-in-tariffs can spur technological innovation that will eventually crowd out fossil fuel energy sources at all scales [8].

Other commentators highlight the potential of small scale, decentralized and community-owned renewable energy as part of a sustainable energy future [9]. There is not space to outline the range and scope of these small-scale community energy transitions here. However, examples such as the island community of Samsoe, Denmark that transformed their energy system from coal to renewable energy [10] and Middelgrunden, Denmark, who installed an off-shore wind development jointly owned by the local municipality and local cooperative members [11] demonstrate this potential. In both cases, a more comprehensive view of energy addressed local needs and sensitivities about energy production and consumption at the local scale. Often, as Fudge et al. [12] discuss in the context of energy transition in the UK, local authorities play a critical role in shifting political, social and technological approaches to policy, design and implementation of local renewable initiatives. Here, local authorities, community groups and NGOs are the key actors that initiate and drive adoption of sustainable energy solutions that have the potential to unsettle how energy transition is perceived at other scales.

At the level of the individual, emphasis has been placed on education and awareness raising to promote the adoption of more sustainable energy behaviour and energy conservation. Programs include labelling and energy certification of products, public service announcements on energy conservation and raising awareness of the value of investments in alternative technologies for personal use [13–15]. Unfortunately, such approaches have been largely ineffective [16,17], in large part because of the continued reliance on assumptions about 'rational' economic actors without reference to broader social contexts.

In such debates, engagement with scale is focused to the most appropriate site at which intervention occurs. However, an exclusively locational focus fails to account for the manner in which the interrelationships among scales are fixed, unfixed and re-fixed by particular social actors pursuing specific sustainable energy outcomes. For example, Owens and Driffill (2008) highlight how education deficit models for shifting energy consumption often fail to take into account the physical, social, institutional and cultural contexts that constrain behaviour [18]. Thus, while we need to consider the sites of these scalar interventions, there are also a range of other factors to consider as well.

3. Scale as relational: a systems approach

Energy research that adopts a socio-technical systems approach moves beyond scale as locational by explicitly acknowledging the multiple ways that technology shapes and is shaped by society. For example, Barry (2002) highlights how energy systems are a product of relationships between technology, politics and political participation across scales [19]. The technology of energy production and use frame and shape practices, norms and institutions that in turn place boundaries around what is open for debate in public participation settings. Therefore, governance arrangements and the politics of energy can only be understood through the power relations across scales from the global to the individual that together define the rules under which energy transition can occur, the actors involved and the roles they play. In essence, to understand the politics of energy transition, we need to also consider how governing practices shape debate about energy alternatives.

Similarly, Shove [20] identifies the need to address the "systems of provision" – the norms, values, practices, institutions and power that shape individual attitudes, behaviours and choices. Questions about politics, power, the role of the state, who is responsible and defining what is feasible all need to be addressed as the policy process "is incapable of conceptualizing transformation in the fabric of daily life on the scale and at the rate required" ([20], p. 1283). From this perspective, the way we think of energy is subject to path-dependence, where existing norms, beliefs and practices "lock in" options due to complex systems tied to the status quo for energy production, supply and consumption. To break out of these system requires significant changes to the large-scale technical networks which are also reinforced by existing mechanisms of governance and policy [21].

Loorbach [22] and Kemp et al. [23] provides a useful framework for understanding multi-level transition management that explicitly embraces the relational elements of scale. Transition is understood to incorporate the recursive relations between different actors at different levels across space and time through activities at strategic, operational and tactical levels. Each level represents different priorities and scope, but taken together, they inform the process of transition management. At the strategic level, activities are focused on cultural and abstract societal systems, including long-term visions, values and goals that guide transition. The tactical level refers to medium-term activities that are interest driven and that shape structures and institutional regimes, rules and regulations that govern how actors engage with each other in the process of transition. Finally, the operational level refers to short-term experiments and actions that lead to new innovations and practices that guide transition management. Together, these levels form the arena where transition occurs. Explicitly acknowledging scalar relations

in such a way highlights how long-term energy transition will be a messy, conflictual and disjointed process as visions, strategies and actions work through the transition process [24].

Hendriks (2009) similarly highlights how the politics of energy transition based on the relations amongst actors at a range of scales privileges the voice of some actors while marginalizing others. Thus a multi-scalar analysis of transition raises important questions about the role of actors at all levels in shaping the legitimacy and accountability of stakeholders in the transition process. Hendriks (2009) argues that by viewing transition management as a network of relations helps to make sense of how strategies, tactics and operations of energy transition play out [25].

While a focus on scale as relational highlights the multi-scalar relations that support or constrain energy transitions, they provide little guidance on how scale is defined and constructed by actors engaged in energy transitions. In our final section of the literature review, we consider the ways that scale are used to mobilize action and innovation to achieve particular energy transition outcomes.

4. Scale as strategy: implications for community mobilisation

In this section we highlight focus on scale not as a geographical concept tied to location or as relationships between levels, but rather on scale as a political strategy where actors draw on locational and relational elements to achieve particular outcomes [26–28]. Here, scale is used creatively and dynamically as a strategy to activate innovation and mobilisation to shift the meaning of energy and energy politics. The focus thus shifts from identifying which scale is most appropriate or how relations between scales create opportunities or constrain energy transitions towards an analysis of how notions of scale are co-produced to generate support to 'do' energy differently and to scale-up impact.

The focus on the struggle to scale-up the appropriate economic, organizational and physical infrastructure for change at broader scales limits the attention to the local social capital that is often the primary resource for initiatives in the first place. This dilemma of scale often results in grassroots efforts making trade-offs between increasing their reach and impact, and their commitment to the context specific values in particular places. They are faced with scaling-up rapidly by mimicking the conventional system (meeting funding requirements, engaging with bureaucracy and policy) and risk becoming appropriated in the process, or methodically assessing their unique assets, commitment and goals as a means of using grassroots innovations to expand their impact [29].

A focus on scale as a strategy highlights how, in the case of community energy, notions of 'community', 'grassroots' or 'local' shape energy projects as emergent and co-produced through the participation of a range of actors. For example, Chilvers and Longhurst (2016) highlight how the process of orchestrating who participates, how and for what reasons produces particular outcomes that shape subsequent actions and participants [30]. Participation is therefore central to the co-production and emergence of energy transition and thinking about participation in diverse ways highlights the multiple ways publics are produced and reproduced. Energy transition may be framed as overly technocratic and exclusive [31], limiting participation to technocrats or policy experts. Alternatively, these transitions might be framed as a grassroots response to local challenges that privilege participants more closely aligned with community needs [32].

In contesting these framings, participants in energy transitions have a range of resources to draw from. Social infrastructure can contest an overly technocratic interpretation of energy transitions by drawing on individual and collective resources to contribute to the capacity to challenge the mainstream, mediate conflicts, manage uncertainties, manage risks, develop alternatives and take action across scales [32,33]. Social infrastructure also refers to the governance structures and relationships that exist between people in place that defines a political and social space where participants can generate and use social capital to advance particular projects or agendas [34]. It provides the interactive aspects of organisations, institutions and individuals that enable them to draw on diverse resources and community capacity [35].

Alongside social infrastructure, context-specific social innovation is critical for re-imagining the relationships between individuals, communities, existing structures and institutions to transform the power dynamics of existing systems [36,29] and can lead to the rapid diffusion of knowledge and practice in particular places [37]. Social innovation and the process of generating new ideas, new interactions and new activities change the direction of social and economic practice by re-imagining civic engagement, participation and empowerment [38].

We now turn to our case study of CEFE to emphasize the importance of understanding the multiple ways scale was invoked to activate the capacity for community energy transition through strengthening a sense of group identity and use of symbols. First we outline the larger context of energy and climate change in Australia.

5. Australian context: understanding the political economy of fossil fuels and the shifting discourses of climate change

Australia has historically had a very high dependence upon fossil fuels whilst at the same time high potential for renewable energy deployment [39]. Combining the country's domestic and exported CO2 emissions to take account of its significant export of coal and other minerals, Australia is the sixth largest emitter of CO2 globally [40]. Much of the commentary around the politics of climate change in Australia has been framed in political economy terms that emphasised the influence of the fossil-fuel industry, to the extent that they have often been seen as having a major role in determining policy [41–43]. In attempting to widen and deepen our understanding of the politics of climate change, Christoff [40] has argued that we need to move beyond a singular focus on the political economy of Australia's energy complex to instead analyse the way that understandings of climate change are discursively constructed and challenged. In doing so, he argues for a periodization of climate change where there have been at least five major eras, which roughly equates with shifts from centre right to centre left Federal governments.[2]

CEFE emerged from the beginning of Christoff's fourth period, coinciding with an upsurge against the Climate Change policies of the Conservative Howard government (1996–2006) and the subsequent election of the Rudd Labour government (2007–2009), when greater momentum for climate change mitigation began and the debate shifted from predominantly scientific and economic arguments to one framed more explicitly in ethical and inter-generational terms. It was also during this period that the discourse shifted towards a focus on viable renewable energy technologies [40].

Alongside these shifts in the discourse of climate change, there were also significant regulatory changes and governing practices at various levels of government that assisted in creating the conditions for the deployment of renewable energy. At the community and household scale the most successful of these technologies today has been solar PV. Changes made since the year 2000 have been significant in increasing the deployment of small-scale solar PV throughout many parts of the country. In the year 2000, a PV rebate program was introduced in Australia which provided up to $4000 for grid connection and standalone PV installations ([44], p. 589). This saw a significant addition of new PV installations with further changes to the criteria for eligibility for solar credits, with a shift in July 2009 from a rebate program to a solar credit structure. Within Australia's renewable energy target there

[2] These are Labour under Hawke (1988–1991); Labour under Keating (1992–1996); Coalition under Howard (1996–2006); Labour under Rudd (2007–2009); and Labour under Gillard 2010–2013. In the period after this, an additional two might be added, namely Coalition under Abbott (2013–2015) and Coalition under Turnbull (2015-).

are two different components, namely a small-scale renewable energy scheme and a large-scale renewable energy target. The solar credit structure was introduced to encourage the proliferation of small-scale PV which is seen as a comparatively underdeveloped part of the sector with considerable success.

While solar PV is an example of where government has facilitated the increased roll-out of alternative technologies through market-enabling policies, there are also examples of where the relations between institutional scales have constrained low carbon transitions. Most notably, while local governments were assigned key roles in ambitious GHG mitigation targets, largely in concert with their federal and state counterparts, there was a mismatch between their stated goals and their capacity to implement their targets same local governments. Indeed, as Cheung et al. [45] found, local government often lacks the institutional capacity and revenue base to fulfil their undoubted potential.

As the next section explains, in the case of CEFE, we see how a grassroots movement was able to harness the potential of this regulatory structure to advance the deployment of both individual and particularly community based renewable energy projects. How they were able to do this is not simply a story of technological innovation or of state-civil society interactions. Indeed, in various ways, the story of CEFE illustrates how a focus on our three readings of scale (locational, relational and strategic) assists in understanding the multi-scalar geographies of community engagement, energy use and climate change.

The information in this section is derived from a reading of the archival information related to CEFE's activities[3] as well as six key interviews that conducted by the first author in March and April 2016. The key informants were chosen because they were at the centre of this organisation throughout its formation and continuation over a decade.[4] Access to this movement was partly facilitated by the fact that the first author has grown up in Tathra, (where CEFE originated and continues to be strongest) and has retained strong connections to the local area. All of the interviews were transcribed and then these transcripts were coded for pertinent themes.

6. Clean Energy for Eternity

Clean Energy for Eternity (CEFE) began their activities in 2006, in the period that Christoff [40] identifies as a significant turning point for Climate Change activism throughout the country. The genesis of the movement is a single event organised on Tathra Beach that aimed to build a human sign, spelling out the words clean energy for eternity to represent a local desire for action on climate change. Although it was initially far from certain that many people would participate in this moment, on the day around 3000 people converged upon the beach. Such a number needs to be put into perspective: the town itself has a population of around 1500 people and the Bega Valley Shire in which it's located, around 30,000 people. To the original organiser of the movement, Dr Matthew Nott, this demonstrated to politicians and policymakers that climate change was an issue of considerable concern to local residents. Despite the fact that there was rising concern in different parts of Australia over the potential impacts of climate change, there appeared few tangible steps being taken by governments at a variety of scales to take action. As one of our respondents commented:

> There wasn't a lot of community awareness about the problem, certainly politicians weren't talking about it, about the problem, local government wasn't physically interested in the problem, it just seemed to be a big blind spot.

Out of this moment a core group began meeting regularly and building upon the success of the initial action in numerous ways. They engaged in an energy audit of the Shire to determine the baseline of the types of energy used, the ways it is used and for what purpose. This supported the local council who had set an energy reduction target but had no real mechanism for what that actually meant or how it would be achieved. CEFE was also able to take advantage of the solar credit scheme to install panels on surf clubs and rural fire stations. The shift in thinking about energy also included the installation of renewable energy on most public buildings in the shire.

Throughout this long process from 2006 until the present, CEFE targeted numerous sites of intervention to continually engage in the creative use of identity building around renewable energy and climate change, most notably through human signs, big swims and art installations to promote, fundraise and raise awareness of these issues.[5] The largest installation was the solar farm at the council owned and operated sewage treatment plant that was purposefully arranged to spell out the word 'Imagine' under the busy Melbourne − Sydney flight path. The activities of CEFE also contributed to building public support for the building of a wind farm on the Monaro plateau, which is located between the Bega Valley and the nation's capital, Canberra.

By the decade's end, CEFE had demonstrated to people avenues of participation and how their individual actions can contribute to addressing the challenge of climate change. As one respondent noted:

> What I see at a collective national and global level is that change really begins right where we are, right where we stand. So if we can set up some healthy models for how we can live differently, how we can manage energy differently how we can set up more sustainable lifestyles and that that can be achieved, you know, with some joy and happiness and some comfort.

In the sections that follow below, we discuss the process that was used to generate community capacity to re-think, re-frame and re-scale notions of energy production and use based on the capacity and context of place. We first discuss the role of symbolism and identity building that created space for the creation of the social infrastructure for such discussions to occur. We then discuss the role of local governments and institutional partnerships in supporting energy transitions beyond individuals and conclude with a discussion of the implications of scale.

7. Symbolism and identity building

CEFE has been particularly effective in the deployment of political symbolism. The use of human signs, the eternity cyclone sculpture, and a range of other initiatives has clearly been successful in capturing the attention of the media and in fostering inclusive and participatory spaces that create tangible opportunities for public involvement. Symbolic initiatives that contributed to identity building were critical in building capacity, raising awareness and generating political support. As one of the core members explained:

> It was based on the basic premise that if you got people together in human signs, whether they were schoolkids on a school oval or they were 3000 people on the beach, in fact the conversations that people had one-on-one with each other while I was standing in their letter, that's actually the beginning of change; because that's actually the beginning of people thinking climate change actually has an impact on my life and maybe there is something that I can do in my own life that might make a contribution.

Another participant identified how the process of creating the signs was also an educational opportunity that raised local awareness of climate change:

> During the time of the assembling and the formation of the human

[3] Much of this archival information can be found at CEFE's website https://cleanenergyforeternity.net.au/.

[4] While the first author already had some entry points in to this group, the interviews with some key informants was facilitated by snowballing, in that initial contacts assisted in reaching out to other members of the group.

[5] A timeline of CEFE's activities can be found here: https://cleanenergyforeternity.net.au/past-campaigns/timeline/.

sign, we could educate all of those participants about the science of climate change, and about the potential solutions of climate change.

The impact of the signs on the beach also provided opportunities for a range of people from diverse backgrounds to creatively engage with climate change action:

> And beyond that I think that there was a really kind of zany and inventive combination between art and science.

Another participant commented on the political utility of the signs:

> Human signs were incredible…. tool to engage the community: ….we got to make [those wacky signs] different shapes different words and that was the thing that sparked media attention because of course the media likes a nice glossy picture and a short little caption. And if you could incorporate a message into your glossy picture and in the caption then you've got a double whammy there…. human signs drew the attention of our political representatives.

In a similar way, the big swims, many of which were up to 8 km in length, symbolised the struggles of an individual to find a way to make a difference to global problems. As one of the participants talked about it:

> There was something deeply moving about seeing the people who participated…in the big swim series…… I remember standing on the bridge at Tathra and watching people finish that 8 km swim down the Bega river and just seeing very slow strokes, of single human bodies, coming down the river and it was sort of like seeing Don Quixote tilting at windmills; but at the same time it was incredibly poignant and incredibly powerful just to see what one human being can do to inspire others; just in saying this matters to me, I am going to make a difference how I can, and how that leadership leads to other people to get it be inspired.

From the first tentative and uncertain step of asking the community to turn out on the beach to spell 'Imagine', the strategic use of community engaged symbols served two key purposes, each of which have elements of our three different understandings of scalar processes. First, the process of participating in these community events had impacts at an individual level. Through their participation in these community events, individual views of energy and the linkages to climate change were transformed and personalized. Individual contributions to the collective action of spelling out words on the beach provided an experiential opportunity to raise questions about where their energy comes from, how it is produced and how they consume it.

Second, the symbols and big swims served to publicize and raise awareness of CEFE's activities in particular, and of energy and climate change issues in general. The widespread support and participation in such community events served to reinforce the view that energy and climate change was something that had to be taken seriously, provided confidence to CEFE that they could draw on a range of support and resources from the community and served to illustrate to local government and other institutions that energy and climate change action would be broadly supported. Taken together, the symbols on the beach and the big swims contributed to a new sense of community identity for Tathra as a place where action to address climate change occurs through efforts to localize renewable energy production.

As Seyfang and Haxeltine [46] suggest, local renewable energy projects require high levels of trust and engagement to support different ways of both challenging assumptions about the role and purpose of energy and for changing practice. This shared sense of identity transcends the individual and community scales and contributed to the social infrastructure that allowed CEFE to draw on individual and collective resources to respond to climate change challenges. The strategic deployment of scale here- involving the rescaling of identity from individual participation in creating symbols on a beach to the changing identity of community- created space for a re-imagining of place. By invoking community as a scalar strategy, social innovation and social infrastructure are privileged over technical innovation and technical infrastructure. In this way, the social infrastructure engendered by CEFE adds to the capacity for communities to 'do things differently'.

8. Local government and community group partnerships

Similar to other local councils in Australia, the Bega Valley Shire Council (BVSC) made commitments to address energy and climate change [45]. However, efforts to achieve those commitments were catalysed by CEFE's efforts. The first step was to conduct an energy audit which aimed to establish a baseline of energy consumption and the potential for renewable energy within the district. The core group of CEFE drew together people with many different backgrounds and skills and collectively they set about trying to undertake this audit in a process that in many ways might be called citizen science. The guiding principle from the audit completed in 2006 was an objective for the Shire to have 50% renewable energy and 50% reduction in energy consumption by the year 2020. As one of the participants noted in interviews:

> Well it is easy to say 50-50 by 2020 but how the hell are we going to do it? And 50% of what? And what's the baseline? So it was a pretty interesting exercise to look at a region, to look at the Bega Valley Shire and try and identify what the energy flows are; so not only how much electricity is being used but how much fuel is being consumed with logging trucks using a lot of fuel for traversing the Shire, moving the transport of food and so forth. And wildcards like how much wood do people collect off farms to burn on-site.

The completion of this audit gave the group considerable credibility and a baseline from which to argue their suggested targets. As a mechanism to generate knowledge through citizen science this audit can be seen as an important step forward in recasting the challenges and potential of energy transitions.

After establishing this audit, the group undertook several different complimentary strategies more or less simultaneously that all served to build on the momentum of public engagement and to scale up the impact of their efforts. On the one hand, they continued to organise events and actions aimed at generating publicity for the movement and for raising money to begin installing renewable energy onto public buildings such as surf clubs and rural fire stations. These actions included more human signs, mountain bike events, big swims and so on continuing throughout the period 2006–2013. On the other hand, they also launched an alliance with the BVSC within the first year of its formation. This direct link between an informal community group and institutions of local government was extremely fruitful but can also be seen as fortunate, since it was facilitated by having key people in the right place at the BVSC.[6] As one respondent indicated:

> The Council has always responded well to Clean Energy [CEFE]; they've been real stalwart supporters of our community-based organisation. We are a non-political organisation, so I guess we were attractive for the council to support. And the fact of the matter is we come up with positive solutions that directly engage the council with the community and that also helped the council because it doesn't have a climate change action policy itself.

As the enthusiasm of the group was very high in its initial years significant progress was made quite quickly with a corresponding increase in the social infrastructure to assist in the advancement of the aims of the group. The initial Bega Valley based organisation was scaled

[6] An important person in this respect was Daniel Murphy, who is the coordinator for Environmental Management for the BVSC. Several key informants stressed that the enthusiasm of Murphy for this project as key to the links formed between CEFE and the BVSC.

out by expanding to five chapters that encompassed towns adjoining in shires (such as Eurobodalla and Jindabyne) as well as a group in a prosperous part of Sydney. More and more actions including human signs and big swims generated visibility and raised significant capital that was then channelled back into projects on community buildings. Within a few years most of the public buildings in the Bega Valley shire had solar panels or small wind turbines, or both. At this stage, community capacity was building and allied organisations were drawn in to the endeavour.

There are several aspects that the processes of community organising in this way that was unusual and their success suggests we pay attention. One of these is that few of the core group of people involved in CEFE could be regarded as "typical" environmental activists and in fact few of them had experience in environmental movements prior to their involvement in CEFE.[7] Secondly, although the group was explicit about its central focus upon climate change and energy projects that may reduce the impacts of a changing climate, many of the community groups that they paired with did not have such a focus. However, the building of community infrastructure such as renewable energy for rural fire services or surf clubs was promoted by CEFE to these groups as a way of reducing their costs and having energy supplies that were independent of the main line in case of emergencies, a factor that is particularly important in the case of rural fire services.[8] The partnerships and synergies forged with these groups reframed the issue of climate change awareness and local action as akin to other community minded volunteer activities. Indeed, CEFE's partnerships with these volunteer organisations were explicitly and symbolically focused upon climate change but were not dependent upon political commitment from these groups. Instead the emphasis in arguing for the critical need for these partnerships:

> We worked with fire brigades, and ambulance services and emergency crews to save them money by us raising funds to put renewable solar and micro wind on their installations, saving the money from their electricity costs they can plough back in to equipment to save lives. So it was a kind of 'we are helping you because you help us when things hit the fan and we get into difficulty'….

Similarly, another participant discussed how making the connections of the diverse threats of climate change was effective at gaining broader support:

> That was part of our life saving energy campaign…. We thought that was a pretty good symbolic message; you know, rural fire stations are at the frontline of climate change, rural fire stations are run by community minded people, volunteers who, who are community minded and they are a very good resource of people to plug into when looking at fundraising for renewable energy.

Through this process, views of locally produced renewable energy were normalized. Questions of how energy was produced and where it came from were previously not thought of. Solar energy was transformed from something that was seen to be risky, unreliable and only of interest to environmentalists became something that just made sense. This process of normalization contributed to a new sense of meaning for energy and also strengthened the social infrastructure that the core group of CEFE could rely on by providing additional support, resources, volunteers and advocates. A similar pattern is discernible with CEFE's engagement with the BVSC, in that the group portrayed itself as community-minded volunteers that were helping the council meet its own objectives rather than a political organisation per se.

The broadening of the activities of CEFE also illustrates the importance of understanding relational scale, in that these institutional partnerships were also extended and were supported beyond the local scale to include efforts and initiatives at the state-level. The success of CEFE was also encouraged by the fact that New South Wales, the state of Australia in which the movement was operating, had a solar buyback scheme that created subsidies for the purchase of solar panels and generous feed in tariffs so that individuals installing solar panels upon their rooms would be able to receive a small ongoing income from the generation of electricity on the rooftops that would go some way towards offsetting the cost of purchasing the solar panels. One organisation that was particularly important in this sense was Pyramid Power which organised a deal for solar panels to be donated to a public building or community organisation. Our respondents believed that this was very important in creating incentives for the spread of solar panels within the Bega Valley shire:

> the proposal was that for every 30 systems that were sold [by Pyramid Power] within a community a 2 kW fully installed grid interactive system would be installed on a community building of that particular group's choice. Now that was pivotal because that really did give the community a win-win situation.

The effective use of partnerships amongst community groups, local council and at the state-level contributed to a multi-scalar discussion of what energy is, where it comes from, how it is used and what a transition towards renewable energy might look like. While these examples serve as an indication of the ability to work across scales, as we will see in the next section, scalar issues also served as a challenge.

9. Challenges of scale

Whilst CEFE undoubtedly achieved a lot in its initial years, it soon became apparent that there were difficulties and challenges across a range of scales. Many of these challenges are encountered by similar social movement organisations attempting to try and scale up their activities or trying to lobby politicians and decision-makers. Whilst the beginning of the movement in 2006 was marked by a significant wave of public support for action upon climate change, this changed to a significant extent as the years progressed. There are significant lobbies within Australia, including those supported by the minerals industry amongst others, that over time were able to create a broader base of climate scepticism than had previously existed [31]. As one of our respondents noted:

> So on the one hand, it seems to me that the politicians are saying what we want to hear, and that is that we should be doing something constructive about climate change; and on the other hand, they are saying something that the big corporations want to hear, which is we must keep burning coal, we must keep digging coal up out of the ground… the frustration for me is it seems that the dividing line between politics and big corporations in this country has become very blurred.

These activities illustrate how unequal power relations shape actions across scales and how the impacts of discourse about climate change and renewable energy transcend scales. It also illustrates the fragility of committed local action and tangible on-the-ground actions in the face of messages and incentives that operate at other scales. Unsurprisingly, this broader national scale when combined with activist

[7] The kinds of people involved in CEFE has varied considerably throughout its existence. The core group of members might be broadly considered professionals, including an orthopaedic surgeon, an environmental scientist, a small businesswoman, a Federal member of Parliament, a horticulturalist and an expert of renewable energy. The nature of campaigns meant that the group drew in many other people at various points of time. It is beyond the scope of this article to fully consider the role that the social and professional background of participants has made on the success of CEFE.

[8] Bushfires occur frequently in many parts of Australia, and have done so for hundreds of thousands of years, particularly over the summer period. There is quite a lot of literature which talks about the prevalence of bushfires in popular culture in Australia and their importance to national identity [49,50]. Just as significantly, the media has a focus on the human toll of bushfires and these events become a mechanism for cultivating a shared sense of tragedy [51]. A changing climate has increased the incidence of bushfires in some parts of Australia, particularly in Spring and Autumn [52]. The connections between bushfires and climate change is reflected in portrayals by the Climate Council of Australia [53] and popular media (see for example, [54]).

burnout meant that over time momentum began to wane.

> I guess we went through a period of government where there was a lot of negativity about climate change, the costs of climate change, the constant threat from the opposition that anything that was going be done on climate change, on the climate change front that would be torn down if they achieve government in the next election cycle. So I guess the fossil fuel lobby and a whole lot of things, it was like the storm clouds of the anti-climate change movement had gathered and they really rain on the parade and they did sap the energy of a lot of volunteers.

Just as challenging was the fact that attempts to scale up the movement met with difficulties because in the case of surf clubs and rural fire services it meant navigating through the large and labyrinthine bureaucracies of these national organisations. Members of CEFE recount how frustrating they found this process, not least because there was a feeling that they were almost successful but fell at the last hurdle because of their inability to maintain consistent relationships with key people within these organisations. Indeed as one of our respondent's recounts, the personnel that they were dealing with within these bureaucracies consistently changed. This meant that any progress they made in moving their national scale proposals through these organisations were continually considered and reconsidered rather than moving towards resolution.

> It's hard when you're working as a volunteer organisation dealing with that sort of bureaucracy where we want to generate change quickly and that is difficult to achieve in a large bureaucratic organisation like Surf lifesaving Australia like the rural fire service and, um, when you start getting setbacks like that it is hard to maintain your enthusiasm as a community group.

Despite the setbacks, over a decade the members of CEFE continued to plan and implement a range of public actions that kept the visibility of the movement in the public's consciousness and continued to deliver renewable energy infrastructure to community groups and public buildings.

One strength of the movement was its capacity to bring in committed people with special or specific talents for one-off or limited periods of time to support specific events or to perform key tasks.[9] More broadly, the capacity for members to increase or decrease their involvement in the movement as other commitments took on more significance in their life or when they felt that involvement in CEFE was taking up too much of their time and energy helped to sustain engagement over the long term.

A final, symbolically significant action, was in building the solar farm in the shape of the word 'Imagine' at the Tathra sewerage works. This project was made possible by members of the community purchasing and then donating individual solar cells, which when fitted together spelt out the word 'Imagine'. Again, as a visually potent and symbolically rich construction, the solar farm encapsulates much of what the movement has tried to move towards during the more than one decade of its existence. There are certainly members of the broader community who are sceptical of the efficacy of the Imagine solar farm sign, pointing out that it would have been more efficient to have the solar panels in a configuration that maximise their footprint and were angled in a way that captured the maximum amount of sunlight. However there is no question that as a visual representation of the aims of the movement it is successful, as well as going some way to assisting the BVSC with infrastructure provision, since it provides 25% of the total power necessary for Tathra's peak usage. As one of our respondents stated:

> [W]e had the idea that we would not just do an ordinary solar farm, because we are Clean Energy for Eternity, we couldn't do it in a normal fashion, we decided that…we wanted the word 'Imagine' written on the solar panels. The solar farm is directly under the flight path to Merimbula airport when you are coming from Sydney and so every day people will fly over and if they look out the window they can see the word 'Imagine'.

The group was also important in creating community support for the building of a wind farm on the Monaro plateau, which is located between the Bega Valley and the nation's capital Canberra. Such efforts illustrate how CEFE has recognized the importance of multi-scalar and multi-technological energy interventions that connect multiple places together in their energy transition efforts. As one of the participants in the energy audit stated:

> So I think the other lesson that we learn from trying to crunch down what you did with 50-50 by 2020 was that one single technology was not enough. We needed to look at trying to bring all of the renewable technologies up to scale. So the other part of what clean energy for eternity did was to try and see the idea for some pilot projects to get renewables up and running. So while the big wins have been Bocco Rock wind farm on the main range and … the Imagine solar farm down at Tathra, it also sowed the seeds for things that are yet to flourish but progress is the beginnings have been made.

These cross-scalar interventions demonstrate the potential beginnings of a much broader energy transformation across the state, that while still nascent, demonstrates the need to approach energy transitions across a variety of scales. The CEFE solar farm was an effort to transmit their efforts beyond place through the hope that the millions of people flying overhead through the busy Melbourne − Sydney air corridor might start their own individual transformation for how energy is viewed by seeing the word 'imagine' spelled out through solar panels. More significant than the view from outside the region was the fact that CEFE was successful in shifting energy and climate change away from either a production and technological problem or an individual consumption problem by reframing the dynamics of energy transitions as inherently embedded within place. It has done this by making explicit connections across scales and between production and consumption across space. In so doing, CEFE has been instrumental in a shift in consciousness of 'energy from somewhere' to a locally engaged 'energy from here'.

10. Conclusion

The paper has provided an analysis of a multi-scalar, community-focused initiative that has successfully promoted localised renewable energy provision. It is clear that the context of practice in the case of CEFE is important in understanding both its successes and its challenges. While energy transitions and climate change education are significant issues facing all communities, the social infrastructure nurtured by the many activities of CEFE has assisted the unique synergies the group has formed with other community based organisations and local governments. These partnerships have been vital to its success over more than a decade. Just as clearly, drawing upon the dynamism of CEFE's community focused activism has also enabled the Bega Valley Shire council to achieve some of its Climate Change mitigation targets by putting renewable energy infrastructure on to public buildings. This partnership has helped this particular shire overcome some of the difficulties that are widely documented to be holding back local government in Australia from contributing to climate change mitigation. CEFE and the wider community provided this capacity through pre-existing

[9] An example of someone who was utilised by the movement for a one-off action is Richard Moffit, a local sculptor who designed and then directed the completion of a huge sculpture of a cyclonic event made out of washing machines and dishwashers. This necessitated the collecting of up to 1000 of these white goods over a six-month period, a task undertaken by volunteers. In a similar way, the accounting procedures necessary for the organisation to be able to undergo an audit was done when necessary by a sympathetic accountant based in Sydney who was associated with the Mosman chapter of CEFE.

social infrastructure and that which was created in the act of building identity and symbolism through the use of human signs that forced the council to re-prioritize what they were doing.

As well as providing an empirical analysis of the achievements, challenges and limitations of CEFE, this paper demonstrated how the use of scale as a heuristic device helps us to understand the ways that energy transitions take place. While much of the literature concentrates on scale as a locational concept, in this paper we have also outlined how scale can be thought of as relational and as a strategy that can enable energy transitions to mobilize grassroots support and encourage energy transitions to be thought about, and enacted, differently. Clearly, then, meaningful energy transitions can only be understood by examining scalar relations and th e differential power dynamics that enforce existing practices. Such a multi-scalar investigation must necessarily include the role of communities and local action in shifting towards more sustainable forms of energy and their relations with these various tiers of government.

At the same time, the difficulties CEFE has faced in scaling-up and scaling-out these initiatives also speaks back to broader literature that has documented the uncertain and messy trajectory of community focused movements as they attempt to move up scales. Again, it is clear that there are no 'silver bullets' when it comes to translating small scale success into broader scale practice, particularly not if the institutional and bureaucratic challenges become more complex at provincial or national scales. However, initiatives such as CEFE provides opportunities to re-frame, re-read and re-generate alternatives [47,48] as a response to climate change challenges.

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